

# METHOD OF DEPOSITING PATTERNED FILMS OF MATERIALS USING A POSITIVE IMAGING PROCESS

[0001] This application is a continuation-in-part of U.S. Patent Application No. 09/874,330, filed June 6, 2001, <sup>NOW U.S. PAT. NO. 6,696,363</sup> pending, which claims the benefit of U.S. Provisional Application No. 60/209,947, filed June 6, 2000. The content of these applications are hereby incorporated herein in their entirety by reference.

## BACKGROUND OF THE INVENTION

### Field of the Invention

[0002] This invention relates to methods for producing patterned films of metal-containing materials on a substrate. More particularly, the methods of the present invention relate to a positive metal organic deposition process for producing patterned films of metal-containing compounds on a substrate through photochemical reactions, photothermal reactions or a combination thereof.

### Description of the Related Art

[0003] The semiconductor and packaging industries, among others, utilize thin metal and metal-oxide films in their products. Examples of conventional processes used to form such thin metal and metal-oxide films include evaporation, sputter deposition or sputtering, chemical vapor deposition ("CVD") and thermal oxidation.

[0004] Evaporation is a process whereby a material to be deposited is heated near a substrate on which deposition is desired. The process is normally conducted under vacuum conditions and comprises vaporizing the material to be deposited and condensing that material on the substrate. A screen or shadow can be used to pattern a film of the desired material on the substrate. Unfortunately, evaporation has several disadvantages such as the need for high temperatures and high vacuum conditions.

[0005] Sputtering is a process similar to evaporation and comprises vaporizing a material to be deposited on a substrate by bombarding the material with incident atoms of sufficient kinetic energy such that particles of the material are dislodged into the vapor phase and condensing the vaporized material onto the substrate. Sputtering not only suffers from the same disadvantages as evaporation but also requires additional consumables and equipment capable of generating the incident atoms.